

What is claimed is:

1. A method of attaching a biological molecule having at least one reactive amino, thiol or hydroxyl group to a solid support having at least one available amino group, the method comprising the steps of:

5 (a) reacting the available amino group on the solid support with an activating compound, the activating compound having the structure:



10 wherein L_1 and L_2 are leaving groups, and X is a moiety capable of nucleophilic substitution so that the reaction results in L_1 being displaced by the available amino group on the solid support to form an activated support; and

(b) reacting the biological molecule with the activated support, thereby displacing L_2 and attaching the biological molecule to the solid support.

15 2. The method of claim 1 wherein L_1 and L_2 are independently selected from the group consisting of halogen, imidazole, triazole, pyrrole, pyrazole, thiazole, tetrazole and O-Aryl-R, and wherein R is selected from the group consisting of halogen, nitro, cyano, and alkoxy moiety.

20 3. The method of claim 2 wherein X is selected from the group consisting of:



wherein R is selected from the group consisting of alkyl, aryl, and OR¹ having no greater than about 18 carbon atoms, and

25 wherein R¹ is selected from the group consisting of alkyl and aryl having no greater than about 18 carbon atoms.

4. The method of claim 1 wherein the activating compound is 1,2,4-carbonyl di triazole.

5. The method of claim 1 wherein step (b) comprises depositing between about 5 to about 25 nanoliters of the biological molecule in the circular spot having a diameter of between about 10 microns to about 500 microns at one or more sites on the activated support.

10. The method of claim 5 wherein the step of depositing comprises printing onto the activated solid support.

15. The method of claim 5 wherein in step b, the reaction occurs in a humid chamber.

8. The method of claim 6 wherein in step b, the reaction occurs in a humid chamber

9. The method of claim 1 wherein step (a) occurs in an organic solution.

20. The method of claim 9 wherein step (a) occurs in the presence of a tertiary organic base.

11. The method of claim 10 wherein step (b) occurs in an aqueous solution.

25. 12. A method of attaching a biological molecule having at least one reactive amino, thiol or hydroxyl group to a solid support having at least one available amino group, the method comprising the steps of:

(a) reacting the available amino group on the solid support with an activating compound, the activating compound having the structure:

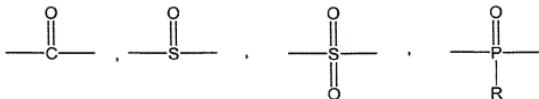
L₁ - X- L₂

5 wherein L₁ and L₂ are identical leaving groups, and X is capable of nucleophilic substitution so that the reaction results in L₁ being displaced by the available amino group on the solid support to form an activated support; and

(b) reacting the biological molecule with the activated support, thereby displacing L₂ and attaching the biological molecule to the solid support.

10 13. The method of claim 12 wherein L₁ and L₂ are selected from the group consisting of halogen, imidazole, triazole, pyrrole pyrazole, thiazole, tetrazole and O-Aryl-R, and wherein R is selected from the group consisting of halogen, nitro, cyano, and alkoxy moiety.

15 14. The method of claim 13 wherein X is selected from the group consisting of:

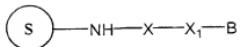


20 wherein R is selected from the group consisting of alkyl, aryl, and OR¹ having no greater than about 18 carbon atoms, and

wherein R¹ is selected from the group consisting of alkyl and aryl having no greater than about 18 carbon atoms.

25 15. The method of claim 12 wherein the activating compound is 1,2,4-carbonyl di triazole.

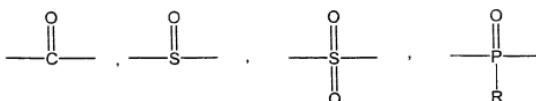
16. A solid-support attached to a biological molecule having the formula:



wherein S is the solid support,

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wherein X is selected from the group consisting of:



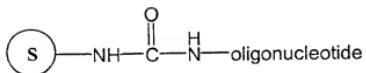
10 wherein R is selected from the group consisting of alkyl, aryl, and OR^1 having no greater than about 18 carbon atoms,

wherein R^1 is selected from the group consisting of alkyl and aryl having no greater than about 18 carbon atoms,

15 wherein X_1 is selected from the group consisting of NH , oxygen, and sulfur, and

wherein B is the biological molecule.

17. A solid-support of claim 16 having the formula:



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18. The method of claim 1 comprising the step of washing from the solid support non-bound compounds after step (a) and before step (b).

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19. A method of attaching an organic molecule to a solid support, the method comprising the steps of:

- (a) activating the solid support; and
- (b) reacting the organic molecule with the activated support in a humid chamber, having a humidity of at least 60 percent relative humidity.